DOCUMENT RESUME

ED 271 528 UD 024 978

TITLE Project MAS 1984-1985. OEA Evaluation Report.
INSTITUTION New York City Board of Education, Brooklyn. Office of Educational Assessment.
PUB DATE 86
GRANT G00-820-2689
NOTE 43p.
AVAILABLE FROM Office of Educational Evaluation, New York City Public Schools, 110 Livingston St., Brooklyn, NY 11201.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; *Bilingual Education; Curriculum Development; Elementary Education; *English (Second Language); Hispanic Americans; *Mathematics Instruction; *Native Language Instruction; Parent Participation; *Science Instruction; Staff Development
IDENTIFIERS New York (Bronx)

ABSTRACT

This multi-site instructional program (Project MAS) provides instruction in English as a second language and native language arts, as well as bilingual instruction in mathematics and science to approximately 400 Spanish-speaking schools. It serves third through eighth graders at four sites in the Bronx. Its instructional and non-instructional (curriculum development, staff development, cultural enrichment activities, parental involvement) components are designed to meet two major needs of program students: to develop their English proficiency and to increase their knowledge of science and mathematics. The evaluation data suggest that Project MAS has met most of its goals. The statistically significant gains in English and Spanish proficiency, mathematics, and in reading (at three grade levels) fulfill the student achievement objectives. Non-instructional objectives were also met: staff felt the various training activities were very useful and the support services were highly effective. Recommendations were (1) to develop strategies to expand the project's role within the two districts and beyond the four school sites; (2) to expand the concept of teaching language through topics to include other content areas such as literature and social studies; (3) to continue to emphasize group cooperation; and (4) to develop more appropriate testing instruments for Spanish and science. (ETS)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED271528

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PROJECT MAS

1984-1985

OEE Evaluation Report

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

T.K. Minter

NYC Bd. of Ed.

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

O.E.A. Evaluation Section Report

Robert Tobias, Administrator of Evaluation
Judith S. Torres, Senior Manager

Grant Number: G00-820-2689

PROJECT MAS

1984-1985

Project Director:
Barbara Gerard

Prepared by the
O.E.A. Bilingual Education Evaluation Unit

Armando Cotayo, Evaluation Manager
Jose J. Villegas, Evaluation/Planning Specialist
Shelley M. Fischer, Evaluation/Planning Specialist

New York City Public Schools
Office of Educational Assessment
Richard Guttenberg, Director

A SUMMARY OF THE REPORT

This multi-site instructional program, in its final year of a three-year funding cycle, provided instruction in English as a second language (E.S.L.) and native language arts, as well as bilingual instruction in mathematics and science to approximately 400 Spanish-speaking students of limited English proficiency (LEP) in grades three through eight. Project MAS was administered centrally by the Office of Bilingual Education of the New York City Board of Education and operated at four sites in the Bronx -- P.S. 27, P.S. 29, I.S. 184, and C.S. 47. Almost 40 percent of the total program enrollment was from the intermediate school; the remaining students were fairly evenly distributed among the three elementary school sites. Almost half of the program population was in two grades: 23 percent were in the sixth-grade and 22 percent were in the fourth-grade. Most of the program students were of Puerto Rican background, some born in New York City and others in Puerto Rico. Others were from Cuba, the Dominican Republic, and several other Central and South American countries. Placement in the program was based on students' scores on the Language Assessment Battery (LAB). However, those students scoring above the cut-off LAB score were also eligible for program participation upon parental request. Thus, the students varied in English language proficiency and native language ability.

The project was designed to develop students' English proficiency and to increase their knowledge of science and math. The project emphasized the functional and communicative aspects of language and incorporated a holistic approach to second language development, whereby students learned the second language by building on communication skills developed in the first language. Both Spanish and English were therefore used in instructional situations. Thus, while students were learning basic concepts in math and science, they were also provided opportunities to transfer communicative skills acquired as part of their native language development to English language learning.

Three funding sources supported Project MAS: tax-levy, Chapter I, and Title VII. Title VII funds supported all administrative and support staff, in addition to five paraprofessionals. Instructional services were provided by tax-levy and Chapter I personnel. Curriculum development efforts were geared to science and language development. Development activities for staff members included training sessions for paraprofessionals provided by the project director and resource teachers; on-site training for paraprofessionals provided by the resource teachers; university courses attended by professional and paraprofessional staff; and professional conferences, seminars, and workshops attended by the project director, resource teachers, and classroom teachers. Parents of program students were involved through the Project MAS advisory board and attendance at training sessions.

Program objectives were assessed in English language development (Language Assessment Battery); mastery of the native language (Spanish Language Assessment Battery); English reading achievement (the New York City Reading Test); and mathematics (New York City Mathematics Test). Quantitative analysis of student achievement data indicates that:

--Fourth-grade students made statistically significant gains on the English version of the LAB, Level 2. The gains for sixth, seventh, and eighth-grade students pretested and posttested on Level 3 were also statistically significant.

--Gains on the Spanish LAB, Level 2 were statistically significant for fourth and fifth graders on all subtests. Gains for sixth graders tested on Level 3 were statistically significant in reading; seventh graders tested on this level made statistically significant gains in listening and reading, and eighth graders gained only on the listening subtest.

--Fourth, seventh, and eighth graders made significant gains on the New York City Reading Test.

--On the New York City Mathematics Test, students in grades three through eight achieved gains of over 36 Normal Curve Equivalent scores.

--Nineteen percent of the fifth grade students and five percent of the eighth-grade students passed the New York City Science Survey.

The following recommendations are aimed at improving the overall effectiveness of similar programs:

1. Since the project completed its final year of Title VII funding in 1984-85, strategies might be developed to disseminate it within the two districts and beyond the four school sites. Communication through district superintendents to more principals about the positive attributes of the project, particularly the communicative approach to language learning integrated with content-area courses, might facilitate replication. Demonstrations by program staff and participating teachers, supported by the particpating districts, could prove valuable.

2. The concept of teaching language as communication through topics presented in science and math has been successfully translated into educational practice. Consideration might be given to expanding this concept to other content areas, such as literature and social studies. The South Bronx Reconstruction Project served as an excellent model for such expansion. Topics on the social and cultural history, as well as the current literary and artistic activities of the area, became themes for specific instructional units. Students became better informed about their own social and cultural backgrounds, and more motivated to learn.

3. The method of creating situations in which all students have a chance to communicate and participate in ongoing learning activities -- such as the use of small groups -- was seen as highly effective. Continued emphasis on group cooperation is strongly recommended for the particular population served by Project MAS.

4. Students' scores on the Spanish and science tests suggests that the instruments are inappropriate. On the Spanish test, students are scoring very high at pretest. This restricts the possibility to demonstrate gains at posttest, resulting in spuriously little growth. Scores on the science test were extremely low, suggesting that the test may be too difficult for this population. The project might explore the use of a different science instrument, or wait until students have greater exposure to the science curriculum.

ACKNOWLEDGEMENTS

The production of this report, as of all Office of Educational Assessment Bilingual Education Evaluation Unit reports, is the result of a cooperative effort of regular staff and consultants. Margaret Scorza and Joseph Rivera have worked intensively to produce, correct, duplicate, and disseminate reports. Without their able and faithful participation, the unit could not have handled such a large volume of work and still produced quality evaluation reports.

TABLE OF CONTENTS

		PAGE
I.	OVERVIEW	1
II.	STUDENT CHARACTERISTICS	3
	Entry Criteria	3
	Composition	3
III.	PROGRAM DESCRIPTION	5
	Program Objectives	5
	Project Design	6
	Organization and Structure	7
IV.	INSTRUCTIONAL COMPONENT	10
V.	NON-INSTRUCTIONAL COMPONENT	12
	Curriculum Development	12
	Staff Development	12
	Cultural Enrichment Activities	13
	Parental Involvement	14
VI.	STUDENT ACHIEVEMENT	15
	Assessment Procedures and Instruments	15
	Growth in English Proficiency	17
	Growth in Spanish Proficiency	22
	Native Language Achievement	27
	English Reading Achievement	29
	Mathematics Achievement	29
	Science Achievement	31
VII.	CONCLUSIONS AND RECOMMENDATIONS	32

LIST OF FIGURES AND TABLES

		PAGE
Figure 1:	Organization and Structure of Project MAS.	9
Table 1:	Distribution of Program Students by Site and Grade.	4
Table 2:	Growth in English Proficiency (Grades Four and Five).	19
Table 3:	Growth in English Proficiency (Grades Six, Seven, and Eight).	20
Table 4:	Patterns of English Proficiency in Third-Grade Students (Pretested and Posttested on Different Levels).	21
Table 5:	Growth in Spanish Proficiency (Grades Four and Five).	24
Table 6:	Growth in Spanish Proficiency (Grades Six, Seven, and Eight).	25
Table 7:	Patterns of Spanish Proficiency in Third Grade Students (Pretested and Posttested on Different Levels).	26
Table 8:	Reading Achievement.	28
Table 9:	Mathematics Achievement.	30

LANGUAGE LEARNING THROUGH MATHEMATICS AND SCIENCE INSTRUCTION
PROJECT MAS

Headquarters:	131 Livingston Street Brooklyn, New York 11201
Year of Operation:	1984-85, final year of a three-year cycle
Target Language:	Spanish
Number of Students:	358
Project Director:	Barbara Gerard
Sites:	P.S. 27, P.S. 29, I.S. 184 (Community School District 7); and C.S. 47 (Community School District 12)

I. OVERVIEW

In its third and final year of funding, Project MAS continued to provide instructional services to 358 students of limited English proficiency (LEP) in grades three through eight. The program emphasizes language learning through concentrated instruction in mathematics and science. It is administered centrally by the Office of Bilingual Education (O.B.E.) of the New York City Board of Education, and it serves four different school sites in the Bronx -- P.S. 27, P.S. 29, I.S. 184, and C.S. 47.

Three of the targeted schools are located in Community School District (C.S.D.) 7. P.S. 27 is an elementary school encompassing kindergarten through sixth grade. In 1984-85, it had a total enrollment of 499 pupils of whom 99 percent were eligible for free lunch. The school's ethnic composition was reported to be 96 percent Hispanic,

which reflects an 11 percent increase in the proportion of Hispanics from the previous year. In 1984-85, as in the previous years, grades four, five, and six participated in Project MAS.

At P.S. 29, of the 598 students, 72 percent are Hispanic and nearly 98 percent come from homes with poverty-level incomes. Students in third-, fourth-, and fifth-grade were eligible to participate in Project MAS.

I.S. 184 serves grades six, seven, and eight; all of these grades participated in Project MAS. There were 718 students enrolled in the school; 88 percent were reported to be eligible for free-lunch, and Hispanics comprised 82 percent of the school population.

Community School 47, located in C.S.D. 12, encompasses kindergarten through sixth-grade. Sixty-eight percent of the 1,212 students are Hispanic; of these, 19 percent are LEP. Grades four, five, and six participated in Project MAS.

In 1984-85, the program was fully staffed and implemented as planned with a project director, two resource teachers, a parent trainer, and five bilingual paraprofessionals.

II. STUDENT CHARACTERISTICS

ENTRY CRITERIA

Project students were selected in the same manner as in previous years. Program services were offered to schools with high concentrations of eligible students who scored below the twenty-first percentile on the English Language Assessment Battery (LAB) and who obtained higher percentile scores on the Spanish version of the LAB than on the English version. In addition, students who were referred by their parents, regardless of their test scores, were also included. Thus, the students participating in Project MAS varied in English language proficiency and native language ability.

COMPOSITION

Project MAS served 358 students in grades three through eight during 1984-85: 76 students at P.S. 27; 67 students at P.S. 29; 138 students at I.S. 184; and 77 students at C.S. 47. See Table 1 for the distribution of project students for whom information was reported, by grade level and by school site.

Most pupils were of Puerto Rican background, some born in New York City and others in Puerto Rico. The remaining students were from Cuba, Ecuador, the Dominican Republic, Honduras, Nicaragua, and other Central and South American countries.

TABLE 1

Distribution of Program Students by Site and Grade

Grade	--------District 7-------- P.S. 27	P.S. 29	I.S. 184	District 12 C.S. 47	ROW TOTAL	PERCENT
3	0	21	0	0	21	6
4	29	23	0	27	79	22
5	25	23	0	23	71	20
6	22	0	32	27	81	23
7	0	0	49	0	49	14
8	0	0	56	0	56	16
COLUMN TOTAL	76	67	138	77	358	
PERCENT	21	19	39	22	100	

- Of all sites, I.S. 184 had the most students (39 percent) participating in the project.
- Twenty-three percent of the program students were sixth graders.
- Only six percent of the students were in the third grade and were located at only one site -- P.S. 29.

III. PROGRAM DESCRIPTION

PROGRAM OBJECTIVES

Following is the list of objectives as stated in the evaluation design of the project proposal:

1. As a result of participating in the program, at least 75 percent of the target student population will demonstrate a significant increase ($p<.05$) in understanding skills in English as measured by a comparative analysis of pretest and posttest raw scores on the understanding language subtest of the Language Assessment Battery.

2. As a result of participating in the program, at least 75 percent of the target student population will demonstrate a significant increase ($p<.05$) in reading skills in English as measured by a comparative analysis of pretest and posttest raw scores on the Language Assessment Battery, Levels 2 and 3.

3. As a result of participating in the program, at least 75 percent of the target student population will demonstrate a significant increase ($p<.05$) in writing skills in English, as measured by a comparative analysis of pretest and posttest raw scores on the Language Assessment Battery, Levels 2 and 3.

4. As a result of participating in the program, at least 75 percent of the target student population will demonstrate a significant increase ($p<.05$) in Spanish language arts, as measured by a comparative analysis of pretest and posttest raw scores on the Spanish Language Assessment Battery, Levels 2 and 3.

5. As a result of participating in the program, at least 75 percent of the target student population will demonstrate a significant increase ($p<.05$) in mathematics concepts and skills in the native language, as measured by a comparative analysis of pretest and posttest raw scores on the New York City Mathematics Test.

6. As a result of participating in the program, at least 75 percent of the target student population will demonstrate a significant increase ($p<.05$) in science concepts and skills in the native language as measured by a comparative analysis of pretest and posttest raw scores on a locally-developed science test.

7. By the end of the third year of the project, the resource teacher, assisted by selected bilingual teachers, will develop 15 instructional science units that will be integrated within existing bilingual education curriculum for LEP students, as evident in the examination of 15 instructional packets.

8. Paraprofessionals in Project MAS will participate in a minimum of 10 training workshops offered by project staff aimed at enhancing their skills for teaching students of limited English proficiency. A content analysis will be performed of the following data sources:

    a. list of workshop topics;
    b. copies of materials distributed at workshops;
    c. lists of attendance;
    d. participants' evaluation forms.

9. Paraprofessionals in the program will enroll in a degree-granting bilingual education program at an institution of higher education in New York State. They will register for at least two courses in such programs.

10. Bilingual teachers in the program will register and attend a credit-bearing mini-course in science education and a credit-bearing mini-course in mathematics education, taught through an institution of higher education in New York State. A content analysis will be performed of the descriptions of each course, and the attendance records will be examined.

11. Participating bilingual teachers in the program will increase their mastery of teaching strategies for math and science instruction as measured by a self-report questionnaire.

12. Participating paraprofessionals in the program will increase their mastery of teaching strategies for mathematics and science, measured by teachers' assessment of their development as reported in a questionnaire.

13. At least 25 percent of the parents of pupils in the program will participate in a minimum of one project-sponsored parental activity as measured by attendance records for activities.

PROJECT DESIGN

Project MAS is designed to serve two major needs of program students -- to develop their English proficiency, and to increase their knowledge

of science and math. The project emphasizes the functional and communicative aspects of language and incorporates a holistic approach to second language development, whereby students learn the second language by building on communication skills developed in the first language. This process is facilitated by placing LEP students in classrooms where they have opportunities to communicate with students with varying degrees of English proficiency. Content in both science and math provides the communicative focus of such classes. Thus, while students are learning basic concepts of problem solving they are also provided with opportunities to generalize the communication skills acquired as part of their native language development to English language learning. Both Spanish and English are therefore used in instructional situations. Similarly this holistic approach to language development teaches students who are English proficient that math and science concepts can also be expressed in Spanish.

To achieve these major goals, the Project MAS design also incorporates the development of bilingual math and science instructional units, the use of educational assistants to support math and science instruction, the provision for Title VII resource rooms at all sites, staff development and training, and parental involvement.

ORGANIZATION AND STRUCTURE

The program director is responsible for the implementation of proposed activities. Her responsibilities include administrative, supervisory, and budget matters pertaining to the program. She reports to

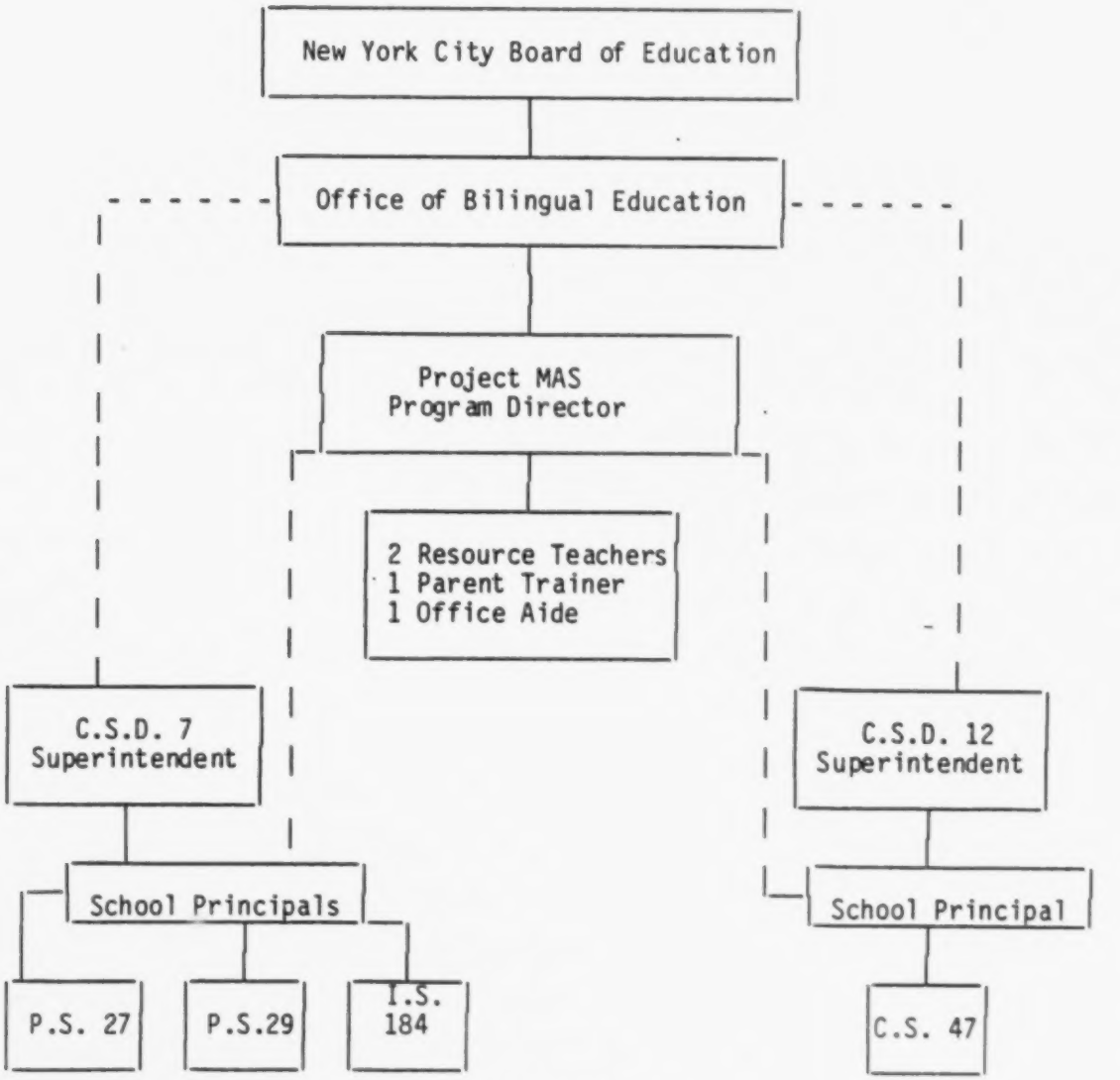
the director of the Office of Bilingual Education (O.B.E.). Directly under her supervision is the Title VII staff consisting of two resource teachers, one parent trainer, and one office aide.

Official communication regarding Project MAS goes from the director of O.B.E. to the superintendents of C.S.D. 7 and 12 and site principals. Communication pertains primarily to planning, funding, changes in approved activities, and testing requirements. The program director communicates directly with site principals on matters related to the implementation of approved program activities.

The principals, with the support of appropriate supervisory staff, supervise the instructional staff at their individual sites. Figure 1 summarizes Project MAS' organizational arrangement within the multi-site structure.

FIGURE 1

Organization and Structure of Project MAS



BEST COPY AVAILABLE

IV. INSTRUCTIONAL COMPONENT

The instructional design for Project MAS calls for the holistic integration of science and mathematics content with the students' language learning experiences. The concepts, processes, and terms of science and math serve as the topics of focus for communicative situations in which both Spanish and English skills are being developed. This approach is intended to convey to LEP students the understanding that the same communicative functions -- to initiate topics, to make comments, to make requests, to negotiate interpersonal relationships, etc. -- can be accomplished through either language.

Project MAS provides the structure, materials, staff, and other resources that are necesary to achieve these instructional goals. New materials, including commercial ones, were adapted for use in the program. Project staff also developed various curriculum units, and created resource rooms or learning centers at each of the four sites.

Additionally, the project created self-contained resource rooms for math and science learning at P.S. 27 and P.S. 29. Due to space limitations at C.S. 47 and I.S. 184, learning centers were created in the back of classrooms. All resource rooms and learning centers were well equipped with a variety of materials for math and science lessons. These materials included microscopes, telescopes, rulers, games, animal cages, batteries, as well as instructional materials on particular content themes, such as banking, metrics, sets and subsets.

The five paraprofessionals were assigned to the various sites four days per week to assist teachers. Two educational assistants were assigned to I.S. 184, and one educational assistant to each of the other three sites. In addition, the project's resource specialists spent one day a week at each site consulting with teachers, providing demonstration instruction, and acting as liaison between the site and the project headquarters.

V. NON-INSTRUCTIONAL COMPONENT

CURRICULUM DEVELOPMENT

A science curriculum and 15 science modules were being adapted by project staff. All materials parallel mainstream curriculum materials.

STAFF DEVELOPMENT

During 1984-1985, Project MAS staff participated in four types of staff development activities: a series of training sessions for paraprofessionals provided by the project director and resource teachers at the central office; on-site training of paraprofessionals provided by the resource teacher; university courses attended by professional and paraprofessional staff; and professional conferences, seminars, and workshops organized by various support service agencies in New York and attended by the project director, resource teachers, and classroom teachers.

The program paraprofessionals reported one day per week to the central office to participate in a series of training sessions. Among the topics covered in these sessions were holistic integration of subjects, mathematics and science mini-courses, the role of the paraprofessional, the classroom environment, and lesson planning.

In addition to these training sessions, paraprofessionals and participating teachers took university courses on the holistic approach to science in bilingual education, and integrating science and mathematics in the bilingual curriculum. These courses were offered at the City College, City University of New York.

The in-service program provided by the resource specialists focused on demonstration and coaching in the transfer of skills to the classroom. The program included how to integrate language learning and content through special projects. Project staff attended staff development conferences at Hunter College, Columbia Teachers College, Yeshiva University, Wave Hill Education Center, Tiorati Learning Center, and Gateway Environmental Center. The topics covered included individualized learning, computer education, environmental education, language acquisition, and science curriculum development.

Several program teachers reported that by participating in the staff development activities, their presentations of mathematics and science instructional materials improved. They also perceived that student interest in instruction increased, and felt they had learned better methods of monitoring students' progress. Finally, they reported that paraprofessionals' instructional strategies improved after participating in the training program.

CULTURAL ENRICHMENT ACTIVITIES

Various cultural enrichment activities were offered during the 1984-85 year, involving the participation of students, parents, and project staff. One example is the South Bronx Reconstruction Project initiated at P.S. 29. Children in grades three through six learned map routes of their area, studied achitectural features and identified buildings for landmark preservation by studying them through a historical perspective.

Students constructed models which were displayed in the school, at a bank, and at a museum.

PARENTAL INVOLVEMENT

Project MAS staff involved students' parents in their children's education by encouraging participation in program activities. Staff also offered training on the role of parents in the educational process through classes and workshops held at each site, as well as city-wide conferences. Other services, such as referrals or translations, were provided to individual parents upon request.

Training sessions for parents at each school site were primarily organized and delivered by the parent trainer under the supervision of the project director and with the assistance of a resource teacher. The trainer spent one day each week per site, and she stated that parental activities at each school varied according to parents' needs. For example, at one site, parents were given sessions of leadership training aimed at increasing their active participation in the Parent Teacher Association. Workshops were given on the importance of homework, teenage problems, and drug abuse. A similar pattern was followed at other sites. Weekly exercise and diet and nutrition classes were also provided, as well as individual services such as referrals to social service agencies, writing letters in English, and translations.

VI. STUDENT ACHIEVEMENT

The following section presents the assessment instruments and procedures used to evaluate the proposed objectives.

ASSESSMENT PROCEDURES AND INSTRUMENTS

Students were assessed in English language development, native language development, mathematics achievement, and science achievement. The following are the program's instructional objectives and the assessment instruments used to determine student achievement:

Objective	Assessment Instrument
Significant increase in understanding, reading, and writing skills in English.	Language Assessment Battery (LAB), English, Levels 2 and 3
Significant increase in Spanish language arts skills.	Language Assessment Battery, Spanish, Levels 2 and 3
Significant increase in math concepts and skills.	New York City Mathematics Test (N.Y.C.M.T.)
Significant increase in science concepts and skills.	New York City Science Survey, Grades 5 and 8

The English and Spanish LAB and the N.Y.C.M.T. were administered once each academic year on a citywide basis. To assess students' achievement on these tests, a correlated *t*-test was computed using students' scores from the previous year (spring, 1984) as the pretest and their most recent scores (spring, 1985) as the posttest. This statistical analysis determines whether the difference between pretest and posttest mean scores is significantly greater than would be expected from chance variation alone. The science test was given to students once in spring, 1985.

The New York City Mathematics Test is designed to measure competence in three interrelated areas of mathematics: concepts of numeration, skill in computation, and application of concepts. The primary purpose of the test is to determine specific areas in which the student is experiencing difficulty. There is a test level for each grade.

The Language Assessment Battery is a series of tests developed by the New York City Public Schools to identify LEP students. The items for the English subtests were selected to provide sufficient "floor" and "ceiling" for LEP students. The tests were normed on the New York City Public School population and measure listening, reading, and writing skills for kindergarten through grade twelve. There are four levels with two forms per level.

	Grade
Level 1	K-2
Level 2	3-5
Level 3	6-8
Level 4	9-12

The Spanish LAB has items similar to those on the English LAB and is divided into the same four levels. The purpose was to design subtests which are equivalent across languages. The Spanish LAB was normed on New York City Public School students with Hispanic surnames. More information on the psychometric properties of the LAB may be obtained from the New York City Public Schools.*

*Office of Educational Assessment, 110 Livingston Street, Brooklyn, New York 11201.

Science achievement was measured with the New York City Science Survey which is designed to assess general science education in grades five and eight in biology, earth science, physics and chemistry. Further information on the psychometric properties appears in Citywide Results of the New York City 1985 Science Survey Grades 5 and 8.*

GROWTH IN ENGLISH PROFICIENCY

Due to missing or incorrect data on grade, raw score, or test level, pretest and posttest LAB scores were available for 239 of the 358 students.

-- 51 students were pretested and posttested at Level 2 in grade four and 44 in grade five;

-- 41 students were pretested and posttested at Level 3 in grade six, 37 in grade seven, and 49 in grade eight; and

-- 17 third-grade students were pretested at Level 1 (grade two) and posttested at Level 2 (grade three).

The English LAB was developed as a screening instrument rather than an achievement measure, and was purposely made to be very easy for native speakers of English. As a result, the percentile distribution is highly distorted. For example, for fifth grade, raw scores from zero to 72 correspond to the first through the twentieth precentile, while raw scores from 73 to 87 correspond to the twenty-first through the ninety-ninth percentile. It is quite possible for a student to gain 35 raw score points and remain at the first percentile. Therefore, percentiles were not used in the analysis.

A t-test was performed for those students who had complete pretest

*Board of Education of the City of New York, Division of Curriculum and Instruction, 1986.

and posttest raw scores on the same test level; the results are presented in Tables 2 and 3. Means and standard deviations are reported in Table 4 for those third-grade students who were pretested and posttested on different test levels. Gain scores could not be computed for students who changed levels because scaled scores were not available.

As Table 2 indicates, students in fourth grade made statistically significant gains in English listening, reading, and writing. However, the gains made by fifth graders were not statistically significant.

Most gains for students pretested and posttested on Level 3 (Table 3) were also statistically significant. Sixth-grade students generally made larger gains than seventh- or eighth-grade students. Eighth graders made gains in listening and reading. Overall, gains on the writing subtest were smaller than on the other subtests.

Gains could not be computed for third graders who were pretested at Level 1 and posttested at Level 2. Means and standard deviations for these students are reported in Table 4.

Overall, results of most *t*-tests for English LAB raw score gains were statistically significant. This suggests that students' improvement in English proficiency was greater than expected by chance. Thus, the program achieved its proposed objective.

TABLE 2

Growth in English Proficiency

Significance of Mean Total Raw Score Differences Between Initial and Final Test Scores of Students with Full Instructional Treatment on the Language Assessment Battery, Level 2, by Grade

(Grades 4 and 5)

			Pretest		Posttest			
Grade	Subtest	N	Mean	Standard Deviation	Mean	Standard Deviation	Gain Difference	Standard Deviation
4	Listening	51	21.6	8.4	24.5	6.2	2.9**	8.2
	Reading	51	19.9	10.5	24.3	9.7	4.4**	10.2
	Writing	51	11.8	6.4	13.3	5.7	1.5**	5.1
5	Listening	44	23.9	6.8	25.3	5.7	1.3	6.3
	Reading	44	22.2	10.9	22.9	10.4	0.8	8.2
	Writing	44	11.9	5.5	13.2	5.0	1.3	4.6

**Statistically significant at the .01 level.

BEST COPY AVAILABLE

TABLE 3

Growth in English Proficiency

Significance of Mean Total Raw Score Differences Between Initial and Final Test Scores of Students with Full Instructional Treatment on the Language Assessment Battery, Level 3, by Grade

(Grades 6, 7, and 8)

			Pretest		Posttest			
Grade	Subtest	N	Mean	Standard Deviation	Mean	Standard Deviation	Gain Difference	Standard Deviation
6	Listening	41	21.8	7.2	28.0	5.4	6.3**	5.8
	Reading	41	25.3	9.5	36.1	9.7	10.8**	10.2
	Writing	41	10.6	5.1	14.5	4.1	3.9**	5.1
7	Listening	37	20.1	9.3	25.8	8.2	5.7**	4.6
	Reading	37	28.3	14.6	33.0	13.4	4.8**	7.9
	Writing	37	12.7	5.7	13.7	5.1	1.1*	3.0
8	Listening	49	24.7	9.1	26.9	9.6	2.2**	6.1
	Reading	49	35.9	15.1	39.3	13.2	3.4**	7.5
	Writing	49	14.9	13.2	14.3	4.9	-0.6	11.7

*Statistically significant at the .01 level.

**Statistically significant at the .05 level.

TABLE 4

Patterns of English Proficiency in Third-Grade Students

Results of the Language Assessment Battery
By Subtest and Test Level*

Subtest	N	Pretest Level 1 Mean	Pretest Level 1 Standard Deviation	Posttest Level 2 Mean	Posttest Level 2 Standard Deviation
Listening	17	21.6	4.1	26.2	2.5
Reading	17	12.6	6.0	20.1	7.2
Writing	17	7.1	4.9	11.9	4.6

*Students in the other grades were pre- posttested at the same level.

Note: Because the tests are at different levels, the number of items increases by level, and the difficulty of items also increases. Therefore, gains can not be computed.

GROWTH IN SPANISH PROFICIENCY

Complete Spanish LAB data were available for 224 of the 393 students reported:

-- 64 students were pretested and posttested at Level 2 in grade four and 56 in grade five;

-- 40 students were pretested and posttested at Level 3 in grade six, 41 in grade seven, and 48 in grade eight; and

-- 17 third-grade students were pretested at Level 1 (grade two) and posttested at Level 2 (grade three).

Table 5 presents the gains in Spanish proficiency for fourth- and fifth-grade students. Gains were statistically significant for fourth and fifth graders in listening, reading, and writing. Native language proficiency gains attained in fourth- and fifth-grades were somewhat higher than those attained in English.

The gains made by students tested on Level 3 varied according to grade and subtest (see Table 6). Students in all grades made gains in all areas; gains for sixth graders were statistically significant only in reading; seventh graders made statistically significant gains on both listening and reading subtests; eighth graders gained only on the listening subtest. Overall, sixth graders made the largest gains in reading.

The writing subtest appears relatively more difficult than the others. The only students to make statistically significant gains tested on Level 3 were those in grade eight.

In general, program students in most grade levels and subtests showed statistically significant gains. This suggests that the program objective regarding native language proficiency was achieved.

As with the English test scores, gains could not be computed for third graders pretested at Level 1 and posttested at Level 2 on the native language subtests. Means and standard deviations for these students are presented in Table 7.

TABLE 5

Growth in Spanish Proficiency

Significance of Mean Total Raw Score Differences Between Initial and Final Test Scores of Students with Full Instructional Treatment on the Language Assessment Battery, Level 2, by Grade

(Grades 4 and 5)

			Pretest		Posttest			
Grade	Subtest	N	Mean	Standard Deviation	Mean	Standard Deviation	Gain Difference	Standard Deviation
4	Listening	64	24.3	7.3	27.3	3.3	3.0**	6.9
	Reading	64	21.2	10.6	27.2	7.8	6.4**	8.3
	Writing	64	11.3	6.4	14.8	5.1	3.5**	5.0
5	Listening	56	27.3	4.5	27.9	3.9	0.7*	2.4
	Reading	56	27.1	8.0	30.5	5.9	3.4**	7.2
	Writing	56	14.3	5.3	17.0	4.0	2.7**	4.9

*Statistically significant at the .05 level.

**Statistically significant at the .01 level.

TABLE 6

Growth in Spanish Proficiency

Significance of Mean Total Raw Score Differences Between Initial and Final Test Scores of Students with Full Instructional Treatment on the Language Assessment Battery, Level 3, by Grade

(Grades 6, 7, and 8)

			Pretest		Posttest			
Grade	Subtest	N	Mean	Standard Deviation	Mean	Standard Deviation	Gain Difference	Standard Deviation
6	Listening	40	28.4	10.5	31.2	4.1	2.8	9.4
	Reading	40	28.2	14.4	39.6	8.6	11.5**	12.9
	Writing	40	14.0	14.7	16.5	2.4	2.5	14.5
7	Listening	41	31.1	3.5	33.7	3.3	2.6**	3.3
	Reading	41	41.2	8.3	43.9	7.9	2.7**	5.9
	Writing	41	16.7	2.1	16.9	2.9	0.2	2.7
8	Listening	48	33.5	2.9	34.2	3.5	0.7*	2.5
	Reading	48	44.0	8.6	44.6	10.4	0.6	8.2
	Writing	48	16.5	3.3	17.8	1.9	1.4**	2.7

*Statistically significant at the .05 level.

**Statistically significant at the .01 level.

TABLE 7

Patterns of Spanish Proficiency in Third-Grade Students

Results of the Language Assessment Battery (Spanish)
By Subtest and Test Level*

Subtest	N	Pretest Level 1 Mean	Pretest Level 1 Standard Deviation	Posttest Level 2 Mean	Posttest Level 2 Standard Deviation
Listening	17	22.8	3.5	26.1	2.0
Reading	17	15.8	6.8	20.8	8.5
Writing	17	6.1	2.9	14.5	3.5

*Students in the other grades were pretested and posttested at the same level.

ENGLISH READING ACHIEVEMENT

Complete reading achievement data were available for 214 students who took the New York City Reading Test (see Table 8). Raw scores were converted to Normal Curve Equivalent (N.C.E.) scores which have a mean of 50 and a standard deviation of approximately 21. Correlated *t*-tests were computed for each grade on pretest and posttest N.C.E.s to determine students' improvement in English.

Overall, students' performance was inconsistent across grades. Fourth, seventh, and eighth graders made significant gains, indicating that these students are progressing at a greater rate than the national sample used to norm the test. Third and sixth graders did not change significantly from pretest to posttest, which indicates that they are progressing at the same rate as the nationwide sample used to norm the test. However, fifth graders demonstrated statistically significant losses.

At this point, it is unclear why some grade levels made statistically significant gains in reading while others made statistically significant losses. One possible explanation is that these could be teacher or school effects, since students were served in a small number of classes at each site.

TABLE 8

Reading Achievement:
Significance of the Total Normal Curve Equivalent (N.C.E.)
Differences Between Initial and Final Test Scores
of Students on the New York City Reading Test, by Grade

Grade	N	Pretest Mean	Pretest S.D.	Posttest Mean	Posttest S.D.	Difference Mean	Difference Standard Deviation
3	12	43.8	10.8	39.2	15.4	-4.6	14.8
4	41	34.4	15.4	50.6	11.4	16.5**	14.5
5	34	48.4	10.1	42.2	14.3	-6.2**	14.1
6	59	39.6	13.5	37.3	12.5	-2.3	10.3
7	31	29.7	14.0	39.9	11.4	10.2**	9.5
8	37	36.1	14.3	45.5	14.7	9.4**	8.2

**Statistically significant at the .01 level.

MATHEMATICS ACHIEVEMENT

Correlated t-tests were calculated on N.C.E. scores for 214 students for whom both pretest and posttest scores were available (see Table 9). This analysis determines whether the difference between mean pretest and mean posttest scores is larger than would be expected by chance variation alone.

Overall, student performance was impressive and consistent across grades. Students in grades three through eight achieved gains of over 36 N.C.E.s. Third graders made the largest gains (50.5), followed by fourth (46.1), sixth (41.7), seventh (39.9), fifth (37.9), and eighth (36.8) graders, respectively.

The pretest and posttest N.C.E. scores provide a relative view of student achievement. The mean N.C.E. score for the norm group is 50; therefore, students exceeding this mean are achieving above national norms. Students in all grades were far below this mean at pretest, most scoring well below the tenth N.C.E. In addition, standard deviations were very small at pretest, suggesting that students were unfamiliar with the test material. When this occurs, scores tend to regress toward the mean. Therefore, individuals scoring very low at pretest are likely to move closer to the group mean at posttest. In all grades, the mean at pretest was low enough to result in significant gains, with third- and fourth graders achieving means above the national norm. It is apparent that students' achievement in mathematics across all grades improved remarkably. Indeed, this program objective was achieved by a large margin.

TABLE 9

Mathematics Achievement

Significance of Mean Normal Curve Equivalent Differences Between Initial and Final Test Scores of Program Students with Full Instructional Treatment on the New York City Mathematics Test, by Grade

		Pretest		Posttest		Difference	
Grade	N	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
3	12	6.4	1.6	56.9	14.4	50.5**	13.8
4	41	6.2	1.8	52.4	14.8	46.1**	13.3
5	34	7.2	2.1	45.2	19.2	37.9**	18.9
6	59	5.9	1.9	47.6	16.7	41.7**	15.8
7	31	4.5	1.8	44.4	14.5	39.9**	13.4
8	37	5.6	1.8	42.4	14.8	36.8**	13.2

**Significant at the .01 level.

SCIENCE ACHIEVEMENT

The New York City Science Survey test was administered in the fifth and eighth grades in the spring of 1985. Data were available for 57 fifth graders and 48 eighth graders. The results of the 1985 science test administration are reported in Table 10.

The test has 60 items, of which the students must obtain correct scores on 39 (65 percent) to receive a passing grade. Results of the 1985 test administration indicate that 19 percent of the fifth-grade students received passing grades. Scores for these students ranged from ten to 52 with a mean of 24 and a standard deviation of 15. Only 5 percent of the eighth graders achieved passing scores. Scores for these students ranged from 11 to 46, with a mean of 27 and a standard deviation of 10.

It is important to point out that citywide performance on the test was rather low; only 50 percent of all fifth-graders and 39 percent of all eighth-graders passed the test. Clearly, the test is difficult even for native speakers of English.

It may be that, citywide, students' exposure to science concepts is still limited. Given their greater exposure to language teaching, LEP students may have received even less science instruction before participating in Project MAS, which may underlie their relatively weaker performance. As a first step toward improving science achievement, the content of the test should be reviewed with respect to the curriculum taught. This issue is one which Project MAS should address.

VII. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The evaluation data suggest that Project MAS has largely met its goals. There is a positive attitude toward the project among staff, students, and parents. There was a consensus among principals, participating teachers, and project staff that the philosophy which guides the project has become clearer to all and was more strongly expressed in the current year.

All participating staff agreed that the various training activities were highly useful in helping them understand and implement the project design. Support services in general were seen as highly effective in achieving the goals the project set for its last year of operation.

The results of student performance on tests used for evaluation indicate that MAS students are generally making statistically significant gains in English proficiency, Spanish proficiency, mathematics, and at three grade levels in reading. Thus, the program is meeting its proposed student achievement objectives in these areas. Performance in science was poor, perhaps due to the inappropriateness of the test.

In English proficiency, gains were statistically significant in all language subtests for grades four, six, and seven in which students were pretested and posttested at the same test level. Fifth-grade students did not make statistically significant gains on any of the subtests;

eighth-graders tested at Level 3 made statistically signficant gains only in listening and reading.

In native language, results were varied by grade level and language subtest. Gains achieved by fourth, and fifth graders were statistically significant on all subtests. Gains achieved by sixth graders were statistically significant only on the reading subtest; seventh graders made gains in listening and reading; eighth graders gained in listening and writing.

In mathematics, the results were impressive across all grade levels, with students making large and statistically significant gains. With pretests below the eighth N.C.E., third- and fourth-grade students were averaging above the national norm at posttest.

In science, only a small percent of fifth and eighth graders reached the 65 percent criterion score in spring, 1985.

In the non-instructional areas, a review of the available data indicate that the program objectives were largely met.

RECOMMENDATIONS

1. Since the project completed its last year of Title VII funding in 1984-85, strategies might be developed to expand its role within the two districts and beyond the four school sites. Communication through district superintendents to more principals about the positive attributes of the project, particularly the communicative approach to language learning integrated with content-area courses, might facilitate expansion. In addition, district support in disseminating the program model, including demonstrations by staff and participating teachers, could prove valuable.

2. The concept of teaching language as communication through topics presented in science and math has been successfully translated into educational practice. Consideration might be given to expanding this concept to other content areas, such as literature and social studies. The South Bronx Reconstruction Project served as an excellent model for such expansion. Topics on the social and cultural history, as well as the current literary and artistic activities of the area, became themes for specific instructional units. Students became better informed about their own social and cultural background, and more motivated to learn.

3. The method of creating situations in which all students have a chance to communicate and participate in ongoing learning activities -- such as the use of small groups -- was seen as highly effective. Continued emphasis on group cooperation is strongly recommended for the particular population served by Project MAS.

4. Students' scores on the Spanish and science tests suggests that the instruments are inappropriate. On the Spanish test, students are scoring very high at pretest. This restricts the possibility to demonstrate gains at posttest. Scores on the science test were extremely low, suggesting that the test may be too difficult for this population. The project might explore the use of a different criterion-referenced instrument until students have have greater exposure to the science curriculum.